UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,240	05/13/2005	Koji Miyata	Q86264	7140

23373 7590 05/27/2010

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
CROWELL, ANNA M	
ART UNIT	PAPER NUMBER
1716	

NOTIFICATION DATE	DELIVERY MODE
05/27/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM
USPTO@SUGHRUE.COM

Office Action Summary	Application No.	Applicant(s)	
	10/525,240	MIYATA ET AL.	
	Examiner	Art Unit	
	Michelle Crowell	1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-21* is/are pending in the application.

4a) Of the above claim(s) *2-5 and 7-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6 and 20-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species III, Figure 12 (claims 6, 20, 21) is acknowledged.

2. Claims 2-5 and 7-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 9, 2010 has been entered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (JP 2001-338912) or Morimoto (J.P. 2001-077095) in view of Nishijima et al. (06-181187).

Referring to Drawings 1 and 2 and paragraphs [0025]-[0033], Ito et al. discloses a magnetic field generator 21 for magnetron plasma, comprising a plurality of magnetic segments 22 provided on the outer side of a process chamber 1 for performing a predetermined process on a substrate placed in said chamber for generating a multi-pole magnetic field 25 along the circumference of said substrate.

Referring to Drawings 1, 2, 5, and 6 and paragraphs [0037]-[0041], [0057]-[0059], Morimoto discloses a magnetic field generator 23 for magnetron plasma, comprising a plurality of magnetic segments 24 provided on the outer side of a process chamber 2 for performing a predetermined process on a substrate placed in said chamber for generating a multi-pole magnetic field 25 along the circumference of said substrate.

Ito et al. or Morimoto fail to teach a magnetic field generator comprises an upper magnetic field generating mechanism and a lower magnetic field generating mechanism and in that said upper and lower magnetic field generating mechanisms are moved vertically in opposite directions toward a horizontal level at which the substrate is positioned to decrease the distance

therebetween and are moved vertically in opposite directions away from the horizontal level to increase the distance therebetween.

Referring to paragraph [0002], Nishijima et al. teaches a magnetic field generator comprising an upper magnetic field generating mechanism 21 and a lower magnetic field generating mechanism 31 in order to confine the plasma. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the magnet field generator of Ito et al. or Morimoto to have an upper magnetic field generating mechanism 21 and a lower magnetic field generating mechanism 31 since this is an alternate arrangement for a magnet field generator that would enhance plasma confinement.

In addition, referring to Drawing 1 and paragraphs [0014]-[0019], Nishijima et al. teaches a plasma processing apparatus using a moving mechanism 22, 32 which vertically moves the upper and lower magnetic field generating mechanisms 21, 31 in opposite directions toward and away from a horizontal level at which the substrate is positioned in order to enhance plasma uniformity. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to vertically move the upper and lower magnetic field generating mechanisms in opposite directions toward and away from a horizontal level at which the substrate is positioned using a moving mechanism as taught by Nishijima et al. in order to enhance plasma uniformity. In addition, when the magnets are vertically moved toward and away from each other, the intensity of the magnetic field will inherently change and thus the intensity can be controlled in this manner.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (JP 2001-338912) or Morimoto (J.P. 2001-077095) in view of Arami et al. (US 6,014,943).

The teachings of Ito et al. or Morimoto have been discussed above.

Ito et al. or Morimoto fail to teach that each of the magnet segments is substantially in the shape of a cylinder.

It should be noted that Ito et al. (par.[0028]) discloses that the shape of the magnet segments can be altered. Referring to Figures 1-3 and column 6, lines 40-67, Arami et al. shows that it is conventionally known in the art for each of the magnet segments to be substantially in the shape of the cylinder. In addition, the shape of the claimed magnet segments is considered a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape of the claimed magnet segments was significant. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the shape of the magnet segments of Ito et al. or Morimoto to be substantially cylindrical as taught by Arami et al. since the shape of the magnet segments is considered an obvious design choice to enhance the desired process.

Response to Arguments

8. Applicant's arguments filed April 09, 2010 have been fully considered but they are not persuasive.

Applicant has argued that the multipole magnetic field of Ito or Morimoto is different from a cylindrically shaped magnetic field of Nishijima et al. and thus one of ordinary skill would not have combined the references. It should be noted that Ito et al.'912 and Morimoto'095 were applied to teach the structure of a multi-pole magnetic field generator. Nishijima et al. was simply applied to teach the concept of vertically moving magnets toward and away from a horizontal level at which a substrate is positioned. Therefore, regardless of the

magnetic arrangement (i.e. cylindrical or multi-pole), when the magnets are vertically moved toward and away from each other, the intensity of the magnetic field will inherently change and thus the magnetic field intensity can be controlled in this manner. Furthermore, the motivation to combine Ito et al. or Morimoto with Nishijima et al. is to enhance plasma uniformity which will result in uniform substrate processing (i.e. deposition or etching). Therefore, the combination of Ito et al. or Morimoto in view of Nishijima et al. teaches a magnetic field generator wherein the intensity of the multi-pole magnetic field is controlled and thus satisfies the claimed requirements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571)272-1432. The examiner can normally be reached on M-Th (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michelle Crowell/
Examiner, Art Unit 1716

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1716